

# Enabling vs. Controlling

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8<sup>th</sup> Annual FTC Microeconomics Conference  
November 12<sup>th</sup> 2015

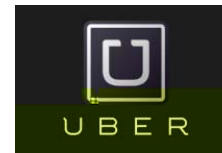
Enabling vs.

# Integrated firms

(employees)

# Platforms

(indep. contractors)



# Goal of the paper

- Tradeoffs between two modes of organization: employment (E) mode vs. platform (P) mode
  - Agents hold more control rights in P mode than in E mode
  - Complete information & two part tariffs in both modes
- Extension of “classic” theory of the firm to platforms => some novel & counter

# Literature review

- Theory of firm: make vs. buy => make vs. enable
  - Property rights (Grossman & Hart, 1986, Hart & Moore, 1990)
  - + Incentive systems (Holmstrom and Milgrom, 1994)
  - + Novel elements (2 sided moral hazard, transferable action, spillovers)
- Distortions due to revenue sharing and linear contracts:
  - Holmstrom (1982), Holmstrom and Milgrom (1987), Romano (1994)
- Hagiwara and Wright (2015a) and (2015b)
- Vertical integration in the platform literature:
  - Gawer and Cusumano (2002), Evans et al. (2006), Gawer and Henderson (2007), Rysman (2009)

# Outline

1. Introduction

Baseline: 1 firm + 1 agent

# Set up

- 1 firm & 1 agent. Profits generated by the relationship:

$$\pi = a + \hat{\theta} (F - \phi) - \hat{F} - \phi$$

non contractible,  
transferable action:

- $\hat{\theta}$  P (e.g. equipment)
- $\hat{\theta}$  L (e.g. price)

firm's non contractible  
effort (non transferable)

agent's non contractible effort  
(non transferable)

*Two sided*  
*moral hazard*

- E mode (employment): firm chooses  $\hat{\theta}$  & incurs  $\hat{\theta}$
- P mode (platform): agent chooses  $\hat{\theta}$  & incurs  $\hat{\theta}$



# Examples

	Transferable decisions(a)	Non transferable investments by agents(e)	Non transferable investments by the firm (I)
Upwork vs. Infosys; HourlyNerd vs. BCG	training	service quality	quality of online system

# Examples

	Transferable decisions(a)	Non transferable investments by agents(e)	Non transferable investments by the firm (l)
Hospitals & their clinics	medical equipment; support staff; advertising of individual clinics	service quality	quality & maintenance of common facilities; advertising of hospital
Franchising	quality & maintenance of outlets; staff benefits & training	outlet manager's effort	product quality (franchisor); national advertising
Producers and sales agents	training; promotion of individual agents	sales effort	quality of product/service; advertising

# The example to remember!

	Transferable decisions(a)	Non transferable investments by agents(e)	Non transferable investments by the firm (l)
Hair salons	price ( $\hat{P}_L$ ) hair products; promotion of individual hair dressers ( $\hat{P}_P$ )	service quality	maintenance & advertising of salon

Set



# Optima

- E mode:

$$+^{3/4} \hat{U} L \quad | = \tau \hat{a} \hat{O} \hat{a} \hat{a} \hat{A}$$

subject to:

$$P \hat{A} = \hat{\epsilon}$$

( s F P \hat{a} )

# General results

- Proposition 1: *In both modes, linear contract is optimal.*
- Proposition 2:

# Linear example

- Suppose

- $4( = \acute{a} A \acute{a} ' L \grave{a} = E \hat{U} A E \ddot{U} +$

- $\hat{Q}( ) = \frac{5}{6} \pm 6, \hat{Q}( ) A \frac{5}{6} A 6$  and  $\hat{Q}( ) + \frac{5}{6} \pm 6$

- Proposition 4: *Firm prefers P mode to E mode iff*

$$\hat{U} P \ddot{U}$$

- i.e. agent's moral hazard > firm's moral hazard



1 firm + N agents

# Set up and timing

- 1 firm &  $N$  agents (symmetric). Total profits generated:

$$\sum_{i=1}^N \left( \frac{1}{5} (4 - \alpha_i) + \frac{1}{5} F(\alpha_i) \right) F(\alpha_i)$$

Spillovers across transferable actions  
 => services can be complements or substitutes

- E mode – firm chooses all  $\alpha_i$
- P mode – agent  $i$  chooses  $\alpha_i$  for  $E, L, s, \alpha, \alpha, \alpha, 0$

# General results

- Proposition 7: *In both modes, linear contract is optimal.*
- Proposition 8:
  - If  $\{c_i\}$  are contractible then  $\hat{p} = \frac{1}{4} \hat{U}_L + \frac{3}{4} \hat{U}$
  - If  $\{c_i\}$  are costless (e.g. price) then  $\hat{p} = \frac{3}{4} \hat{U}_M + \frac{1}{4} \hat{U}$  due to spillovers
    - If  $U(x, y)$  is additively separable then  $\hat{p} = \frac{3}{4} \hat{U}_M + \frac{1}{4} \hat{U}$

Costly

# Costly $a_i$ 's and additively separable $R$

Counter intuitive results (opposite of "classic" theory of firm):

- Moderately negative  $T \Rightarrow$  larger



# Costless $a_i$ 's and non additively separable R

- Substitutes or strong complements  $\Rightarrow + \frac{3}{4} \hat{U}_P \hat{U}_E$ 
  - E mode internalizes spillovers
- Weak complements  $\Rightarrow + \hat{U}_P \hat{U}_E$ 
  - complements  $\Rightarrow$  prices too high in P mode  $\Rightarrow$  offset 2 sided moral hazard (strategic complementarity btw. prices and efforts)
- Agents' and firm's moral hazard have same effect on E vs. P tradeoff
  - revenue sharing does not distort price  $\Rightarrow$  both modes balance 2 sided moral hazard in the same way





# Conclusions

- Important strategic choices: positioning between platform (independent agents) and traditional firm (employees)
- Control rights over non contractible decisions => extend theory of the firm to incorporate platforms

Enabling vs.

# Conclusions

- Important strategic choices: positioning between platform and integrated firm
- Control rights over non contractible decisions => extend theory of the firm to incorporate platforms
- New “style of modeling” (multi sided) platforms => novel economic tradeoffs + empirical predictions
- Current/future work:
  - Partial delegation as intermediate mode between P mode and E mode
  - Competition between different modes

Thank you for your attention.